

REMARKS

Applicant has withdrawn from further consideration claim 4, which is drawn to non-elected subject matter.

Claims 1-3 and 5-20 are under examination. Applicant respectfully requests that the Examiner reconsider this application in view of the following remarks.

Rejection under 35 U.S.C. § 112, second paragraph

The Examiner rejects claim 10 on the ground that “acrylic or (methyl)acrylic acid” recited therein is indefinite. More specifically, he asserts that acrylic acid is the same as (methyl)acrylic acid. See the final Office Action, page 3, lines 4-10.

Applicant disagrees. (Methyl)acrylic acid contains an additional methyl group compared with acrylic acid. See the structures of acrylic acid and (methyl)acrylic acid shown below, the methyl group in (methyl)acrylic acid bold-faced:



acrylic acid



(meth)acrylic acid

Thus, contrary to the Examiner's belief, acrylic acid and (methyl)acrylic acid are different and claim 10 is definite.

Rejection under 35 U.S.C. § 102

The Examiner rejects claims 1-3 and 5-20 for anticipation, relying on Chang *et al.*, US Patent 5,955,532 (“Chang”). See the final Office Action, page 3, lines 15-16. Applicant will discuss independent claims 1 and 5 first.

Claim 1 covers an emulsifier-free microgel prepared by first obtaining polyacrylate (A) containing a hydroxyl group and a carboxyl group, in the presence of compound (B) containing a phosphonic acid group; and then crosslinking polyacrylate (A) thus obtained with aminoplast resin (C). Since compound (B), which is used to prepare polyacrylate (A), contains a phosphoric acid group, the thus-obtained

polyacrylate (A) also contains a phosphonic acid group, in addition to a hydroxyl group and a carboxyl group. In other words, polyacrylate (A) features coexistence of three chemical moieties, i.e., a hydroxyl group, a carboxyl group, and a phosphonic acid group.

Claim 5 also covers an emulsifier-free microgel. The microgel is prepared by first obtaining polyacrylate (E) via copolymerisation of monomer (i) having a polymerisable double bond and a hydroxyl group, monomer (ii) having a polymerisable double bond and a carboxyl group, and monomer (iv) having a polymerisable double bond and at least one phosphonic acid group; and then crosslinking polyacrylate (E) thus obtained with minoplast resin (C). Like polyacrylate (A) recited in claim 1, polyacrylate (E) features coexistence of three chemical moieties, i.e., a hydroxyl group [derived from monomer (i)], a carboxyl group [derived from monomer (ii)], and a phosphonic acid group [derived from monomer (iv)].

In sum, both claims 1 and 5 require a polyacrylate featuring coexistence of a carboxyl group, a hydroxyl group, and a phosphonic acid group.

Chang teaches a graft polymer prepared by copolymerizing various ethylenically unsaturated monomers, one of which contains a carboxyl group. See column 1, line 50 through column 2, line 14. It follows that the Chang graft polymer contains a carboxyl group. Unlike claims 1 and 5, Chang does not teach or even suggest a unique polymer such as the polyacrylate required by claims 1 and 5, i.e., having all three of the following chemical moieties: a carboxyl group, a hydroxyl group, and a phosphonic acid group. Applicant therefore submits that this reference does not anticipate claims 1 and 5.

According to the Examiner, Chang describes an example in which a polyacrylate was prepared from, among others, a monomer containing a carboxyl group and a monomer containing a hydroxyl group, in the presence of a cobalt chain transfer agent (column 10, lines 10-35) and also teaches replacement of the cobalt chain transfer agent with vinyl phosphonic acid (column 5, lines 43-45). See the final Office Action, page 3, lines 3-6. The Examiner proceeds to conclude that Chang discloses the polymer covered by claims 1 and 5, which has a carboxyl group, a hydroxy group, and a phosphonic acid group. Applicant disagrees.

Applicant would like to point out that Chang teaches that any ethylenically unsaturated monomers, as long as one of them contains a carboxyl group, can be used in preparing a graft polymer. In the above-mentioned example, a monomer containing a hydroxy group was randomly chosen. However, this reference, as a whole, does not specifically require using a monomer containing a hydroxy group. Indeed, Chang discloses using a very large spectrum of monomers, including a monomer containing hydroxyl group. Further, Chang teaches using a chain transfer agent selected from a large group consisting of various cobalt compounds, ethylenically unsaturated sulfonic, sulfinic, phosphoric, phosphonic acid, or their esters, allyl sulfide, and malonate. See column 5, lines 40-55. As Chang teaches using any kind of ethylenically unsaturated monomers and any chain transfer agent selected from a very large number of options, it at most teaches a broad genus that encompasses the polyacrylate required by claims 1 and 5, which contains all three of the following chemical moieties: a carboxyl group, a hydroxyl group, and a phosphonic acid group.

In this connection, Applicant would like to point out that the law is well established that “[a] prior art reference that discloses a genus still does not inherently disclose all species within that broad category’ but must be examined to see if a disclosure of the claimed species has been made or whether the prior art reference merely invites further experimentation to find the species” MPEP § 2112.IV, citing *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1367, 71 USPQ2d 1081, 1091 (Fed. Cir. 2004).

Here, Chang merely teaches a broad genus. Since it does not mention a polyacrylate having a carboxyl group, a hydroxyl group, and a phosphonic acid group, no “disclosure of the claimed species has been made.” Further, as it is silent on using a monomer containing a hydroxy group and a phosphonic acid transfer agent together, this prior art reference even fails to “invite further experimentation to find the species.” According to the MPEP guideline quoted above, Chang, contrary to the Examiner’s belief, does not disclose a polyacrylate having a hydroxyl group, a carboxyl group, and a

phosphonic acid group as required by claims 1 and 5. In other words, claims 1 and 5 are novel over Chang.

Claims 2, 3, 8-10, and 12-20 depend from claim 1. Claims 6, 7, and 11 depend from claim 5. For the reasons set forth above, all of these dependent claims are also novel over Chang.

Rejection under 35 U.S.C. § 103

The Examiner also rejects claims 1-3 and 5-20 for obviousness, relying on Chang. See the final Office Action, page 3, lines 15-16. Independent claims 1 and 5 will be discussed first again.

As discussed above, independent claims 1 and 5 are limited to a polyacrylate featuring coexistence of (i) a carboxyl group, (ii) a hydroxyl group, and (iii) a phosphonic acid group.

Chang merely discloses a broad genus of graft polymer prepared from ethylenically unsaturated monomers. One of the monomers contains a carboxyl group, and the others may or may not contain any functional group. Chang also teaches using a chain transfer agent, which is selected from a very large number of options, e.g., vinyl phosphonic acid. See the discussion above. There are no express teachings in Chang that a graft polymer is prepared by using a phosphonic acid transfer agent and a monomer containing hydroxy group. Thus, to arrive at the claimed species, one skilled in the art would have had to pick and choose phosphonic acid from a large group of chain transfer agents and then pick and choose monomer containing a hydroxy group from an even larger group. In sum, Chang teaches a very large genus that encompasses the polyacrylate required by claims 1 and 5, which contains all three of the following chemical moieties: a carboxyl group, a hydroxyl group, and a phosphonic acid group.

Applicant would like to point out that, according to MPEP 2144.08, to determine whether one of ordinary skill in the art would have been motivated to select the claimed species, Office personnel should consider, among other factors, “the size of the genus” and “the express teachings.” As discussed above, Chang teaches a very large genus

Applicant(s) : Horst Mueller
Serial No. : 10/567,616
Filed : February 7, 2006
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Client Ref. No.: 123/03006US

encompassing the claimed species and offers no express teachings of using a monomer containing a hydroxyl group and a phosphonic acid transfer agent together to prepare the polymer required by claims 1 and 5. In view of these facts, one of ordinary skill in the art clearly would not have been motivated to select the claimed species from the genus taught in Chang. In other words, claims 1 and 5 are not rendered obvious by Chang.

For the reasons set forth above, claims 2-3 and claims 6-20, which depend from either claim 1 or claim 5, are also not rendered obvious by Chang.

CONCLUSION

In view of the above remarks, Applicant submits that the rejections raised by the Examiner have been overcome and claims 1-3 and 5-20, as pending, are definite and patentable over the cited prior art. It is respectfully requested that the Examiner promptly allow these claims.

The Extension of Time fee in the amount of \$65 is being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to Deposit Account No. 50-4189, referencing Attorney Docket No. 68002-007US1.

Respectfully submitted,

Date: 9-18-09

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